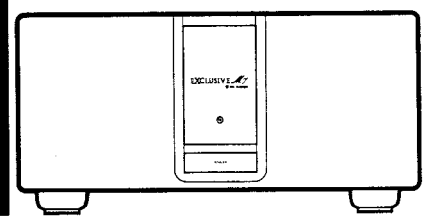
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
ARP2798

POWER AMPLIFIER

EXCLUSIVE *M7*

EXCLUSIVE M7 HAS THE FOLLOWING:

Type	Power Requirement	Remarks
NEWZ	AC 230V only	

- **This manual is applicable to EXCLUSIVE M7/NEWZ.**

CONTENTS

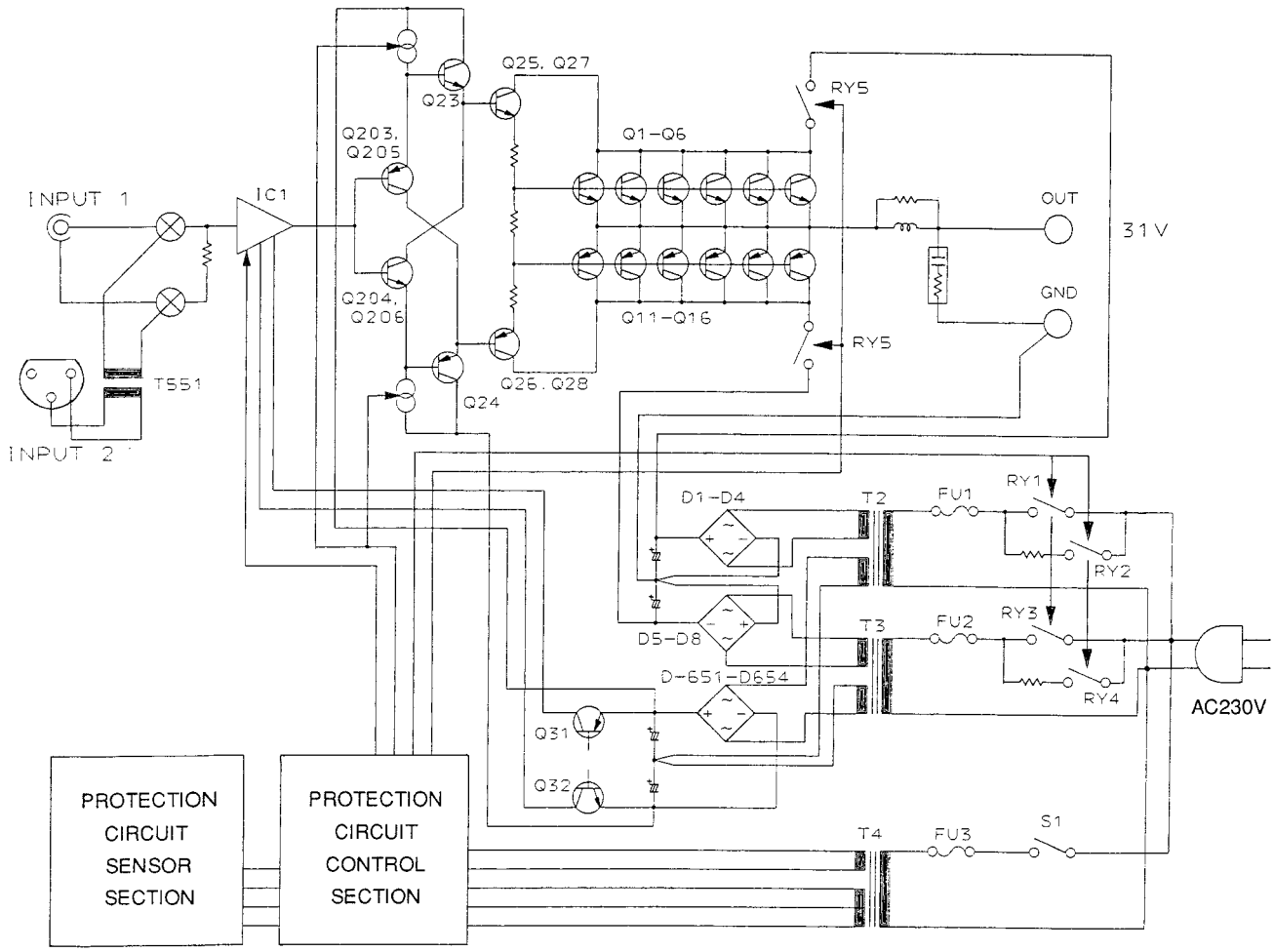
1. BLOCK DIAGRAM 2
2. EXPLODED VIEWS, PACKING AND PARTS LIST ... 3
3. SCHEMATIC AND PCB CONNECTION DIAGRAMS 8
4. PCB PARTS LIST 31
5. ADJUSTMENTS 34
6. CIRCUIT DESCRIPTION 35
7. PANEL FACILITIES 36
8. SPECIFICATIONS 36

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 300 Allstate Parkway Markham, Ontario L3R 0P2 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

© PIONEER ELECTRONIC CORPORATION 1993

FK JUNE 1993 Printed in Japan

1. BLOCK DIAGRAM



Input Section

The 2 inputs of coaxial and balanced are switched with the input selector switch, using an earth separator system for switching between hot earth. Further, the balance input is converted to unbalanced status with a line transformer.

Amplifier Section

The voltage amplification stage and power amplification stage are separated, and negative feedback is carried out only for the voltage amplification stage but not for the power amplification stage, and there is no total feedback loop.

Power Supply Section

One toroidal transformer each is exclusively used for the plus side power supply and the minus side power supply, through which plus and minus balance is maintained. An exclusive transformer is also used the control system, isolating the audio system.

Protection Circuit Section

The control section is composed of the overload, DC and temperature detection (sensor) section and the relay and semiconductor switch control section and it also carries out muting operation when the power switch is turned ON/OFF, as well as in-lash blocking operation.

2. EXPLODED VIEWS, PACKING AND PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Mark	No.	Description	Parts No.
	1	Front panel	ANB1541
	2	Front sub panel	ANB1542
	3	Q21,Q24 Power transistor	2SA1006B
	4	Q31 Transistor	2SA1306
	5	Q26,Q28 Transistor	2SA985A
	6	Q25,Q27 Transistor	2SC2275A
	7	Q22,Q23 Power transistor	2SC2336B
	8	Q32 Transistor	2SC3298
	9	IC1 Voltage amp module	AXX1036
	10	D1 −D8 Fast recovery diode	F10KF20
	11	R1,R2 Cement resistor	ACN1045
	12	Q1 −Q6 Power transistor (L)	2SC2922
	12	Q11 −Q16 Power transistor (R)	2SA1216
	13	R6 Carbon film resistor	RD1/4PM100J
⚠	14	C6 CFPA(0.047/AC250V)	ACE1004
⚠	15	C1,C2 CKA(0.01V/AC400V)	ACG1003
⚠	16	C3,C21 −C24,C27 CKA(0.01V/AC150V)	ACG1005
	17	C12 Electrolytic capacitor	ACH1230
	18	C13 Electrolytic capacitor	ACH1231
	19	C14 Electrolytic capacitor	ACH1232
	20	C15 Electrolytic capacitor	ACH1233
	21	C7−C10 ELECT. Capacitor	CEAS100M50
	22	C17 Ceramic capacitor	CKDYF223Z50
	23	C16 Ceramic capacitor	CKDYX104M25
⚠	24	T2 Power transformer	ATS1455
⚠	25	T3 Power transformer	ATS1456
⚠	26	T4 Power transformer	ATT1213
⚠	27	T5 Power transformer	ATT1214
	28	L1,L2 Ferrite core	ATX1015
⚠	29	S1 Switch	ASG−542
⚠	30	RY1 −RY4 Power relay	ASR1041
	31	RY5 Power relay	ASR1042
	32	Pin jack (1P)	AKB1065
NSP	33	Terminal 2−P	AKC−071
	34	Ground terminal	AKE1035
	35	CN Speaker terminal 1 −P	AKE1044
	36	CN Speaker terminal 1 −P	AKE1045
NSP	37	Socket (3P)	AKP1126
	38	Fuse holder	AKR1005
⚠	39	FU1,FU2 Fuse (T2.5A)	AEK−512
⚠	40	FU3 FUSE (T250MA)	AEK−503
	41	PL1,PL2 LAMP (8V, 50MA)	AEL−110
⚠	42	AC Power cord	ADG1139
	43	J713 Wire with thermal SW (L)	ADX1837
	43	J714 Wire with thermal SW (R)	ADX1838

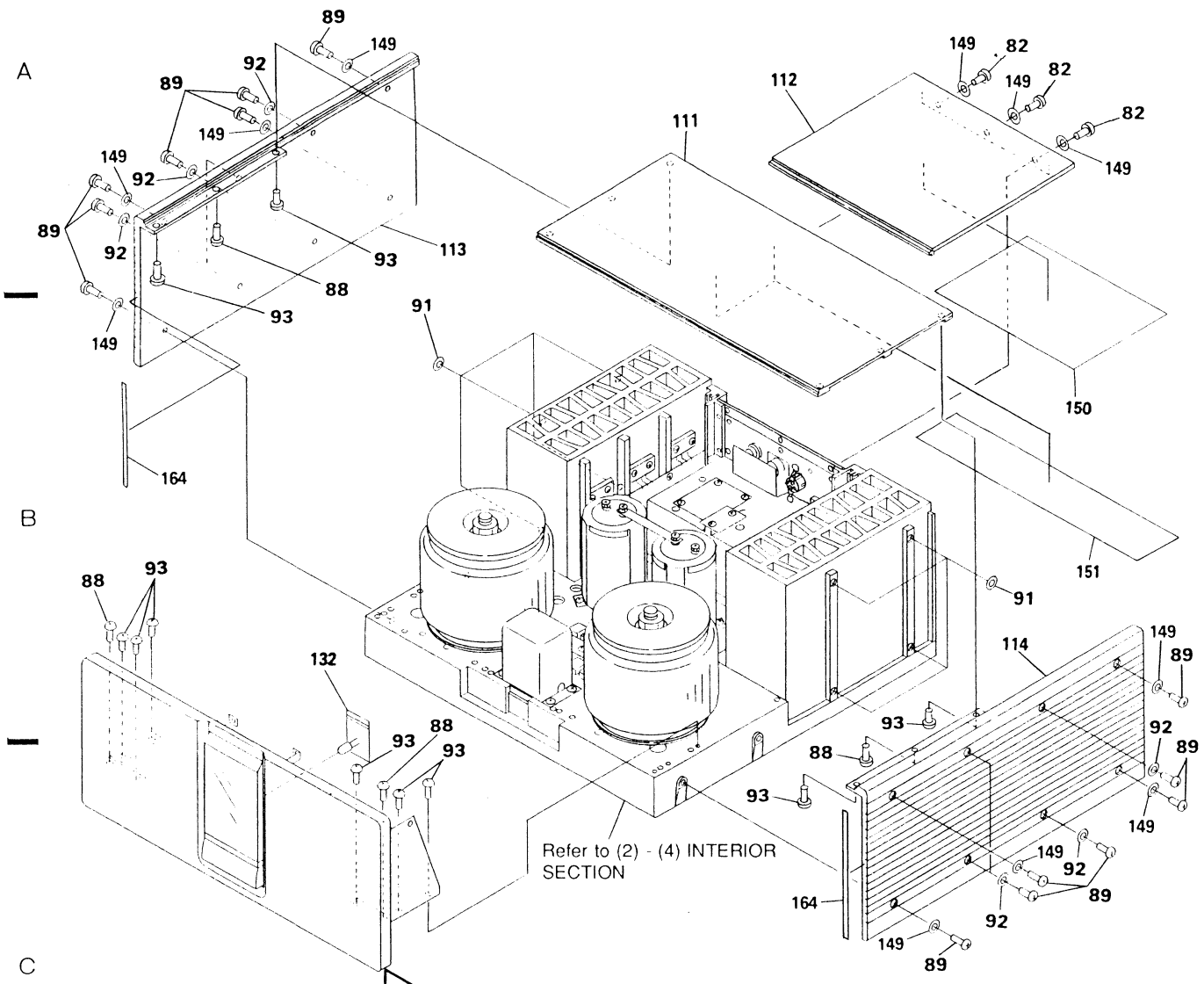
Mark	No.	Description	Parts No.
NSP	44	Chassis	ANA1195
	45	Rear panel	ANC2095
	46	Front stay L	AND1054
	47	Front stay R	AND1055
NSP	48	Bottom plate	ANF1097
	49	Heat sink L	ANH1418
	50	Heat sink R	ANH1419
	51	Foot	ANL1035
	52	AC Cord cover	ANF1075
NSP	53	AC Cord spacer	ANG1529
	54	Holder A	ANG1785
	55	Holder B	ANG1786
	56	Transformer holder	ANG1787
	57	Power SW holder	ANG1788
	58	Sub panel holder L	ANG1793
	59	Sub panel holder R	ANG1794
	60	Rotary SW supporter	ANG1798
NSP	61	Shield case A	ANK1229
	62	Shield case B	ANK1230
	63	Shield case C	ANK1231
	64	Shield plate	ANK1233
	65	Power TR shield plate	ANK1234
	66	Buss bar A	ANK1235
	67	Buss bar B	ANK1236
	68	TR holder	ANK1240
	69	Lens spacer	AAK2403
	70	Coil spring	ABH1087
	71	Cushion A	AEB1248
	72	Cushion B	AEB1249
	73	Transformer cushion	AEB1250
	74	T0−3P sheet	AEB1241
	75	T0−220 sheet	AEB1244
	76	Binder	AEP−215
	77	Screw (Steel)	ABA−297
	78	Screw	ABA−298
	79	Screw (Steel)	ABA1006
	80	Screw (Steel)	ABA1009
	81	Screw (Steel)	ABA1011
	82	Screw (Steel)	ABA1014
	83	Screw (Steel)	ABA1016
	84	Screw	ABA1024
	85	Screw	ABA1027
	86	Screw (Steel)	ABA1048
	87	Screw (Steel)	ABA1076
	88	Screw	ABA1101

Mark	No.	Description	Parts No.
	89	Screw	ABA1172
	90	HEX. Screw	ABA1173
	91	Washer (Glass fiber)	ABE1006
	92	Washer	ABF1027
	93	Screw (Steel)	ABA1004
	94	Screw	CCZ30P060FCC
	95	Nut	NAX6FMC
	96	Nuts	NB40FMC
	97	Screw	PBZ40P080FZK
	98	Screw	PMZ30P050CAD
	99	Power button shaft S	ANL1057
	100	Screw	PMZ50P060CAD
	101	Washer	WBX6FMC
	102	Washer	WS40FMC
	103	Gold ornament	AAH1064
	104	Front glass	AAH1065
	105	Indicator lens	AAK2303
	106	Plate	AAK2406
	107	Input SEL. knob	AAB1332
	108	Power button holder	AAC1052
	109	Power button	AAD2383
	110	Power button shaft	ANL1056
	111	Top plate F	ANE1393
	112	Top plate R	ANE1394
	113	Side plate L	ANE1395
	114	Side plate R	ANE1396
	115	.....	
	116	Operating instruction(English, German)	ARC1437
	117	Polish cloth	E33−009
	118	Front rear pad	AHA1570
	119	Packing case	AHD2577
	120	Packing sheet	AHG1190
NSP	121	CHOKE ASS'Y	AWZ4833
	122	I AMP ASS'Y	AWZ4834
	123	INPUT ASS'Y	AWZ4835
NSP	124	R−DIODE ASS'Y	AWZ4836
	125	REGULATOR ASS'Y	AWZ4837
NSP	126	RELAY ASS'Y	AWZ4838
	127	N−POWER ASS'Y (L side)	AWZ4839
	127	P−POWER ASS'Y (R side)	AWZ4840
	128	LINE TRANS ASS'Y	AWZ4852
NSP	129	P−DIODE ASS'Y	AWZ4841
	130	CONT. ASS'Y	AWZ4842
NSP	131	LAMP ASS'Y	AWZ4843
NSP	132	LED ASS'Y	AWZ4844
	133	SENSOR ASS'Y (A)	AWZ4845
	134	SENSOR ASS'Y (B)	AWZ4846
	135	REG. ASS'Y(A)	AWZ4847
	136	REG. ASS'Y(B)	AWZ4848
	137	REG. ASS'Y(C)	AWZ4849
	138	TR ASS'Y(A)(L side)	AWZ4850
	138	TR ASS'Y(B)(R side)	AWZ4851
	139	TR cover L	ANG1724
	140	TR shield plate	ANK1161
	141	J708 Wire with housing (3P)	ADX1824

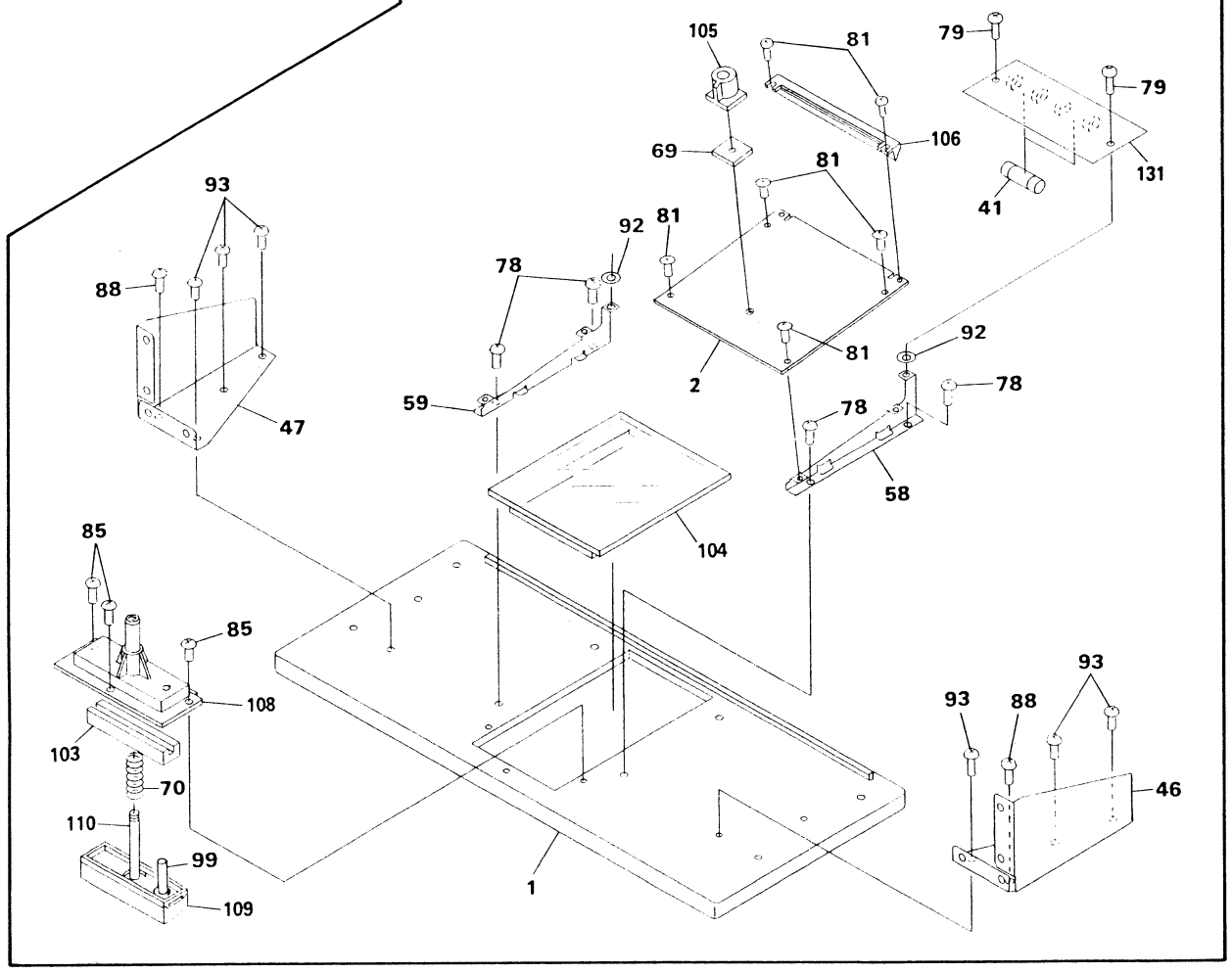
Mark	No.	Description	Parts No.
	142	.....	
	143	Screw (Steel)	ABA1050
	144	Screw	ABA1054
	145	Washer	ABE−041
	146	Screw	BBT30P100FCC
	147	Washer	WB40FMC
	148	Washer (Copper)	ABE1001
	149	Washer	WH40FCR
	150	Sheet B	AEC1503
	151	Sheet A	AEC1502
	152	Screw	BMZ35P060FMC
	153	Nut	NK90FCU
	154	Screw	PMZ30P060FCC
	155	Barrier A	AEC1522
	156	Barrier B	AEC1536
	157	Screw	ABA1180
	158	PCB support	AEC1237
	159	Screw	FBT40P080FCR
	160	Screw	PMZ40P060CAD
	161	Screw	ABA1185
	162	Screw (Steel)	ABA1192
	163	AC cord mould	AMR2263
	164	Side plate Packing	AEB1237
NSP	165	Binder	AEC−826
	166	Washer	ABE−053
	167	Screw	ABA1082
	168	Screw	BBZ40P120FCU
	169	Washer	WG90FMC
	170	Cushion C	AEB1245
	171	CR ASS'Y (CR1)	AXW1006
	172	Cover	AEC−294
	173	C25, C26 Ceramic capacitor	CKDYB222K500
	174	C18 Mica capacitor	CMA221J500
	175	C19, C20	CQSXA102J160

• EXPLODED VIEWS

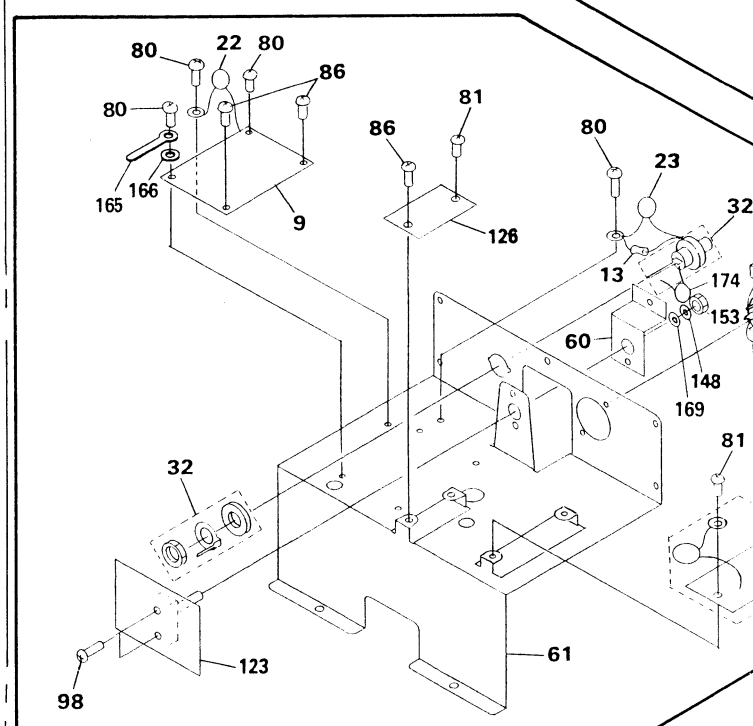
(1) EXTERIOR SECTION



FRONT PANEL SECTION

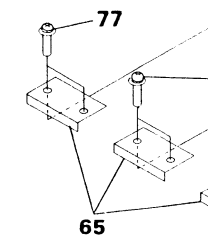


SHIELD CASE A SECTION

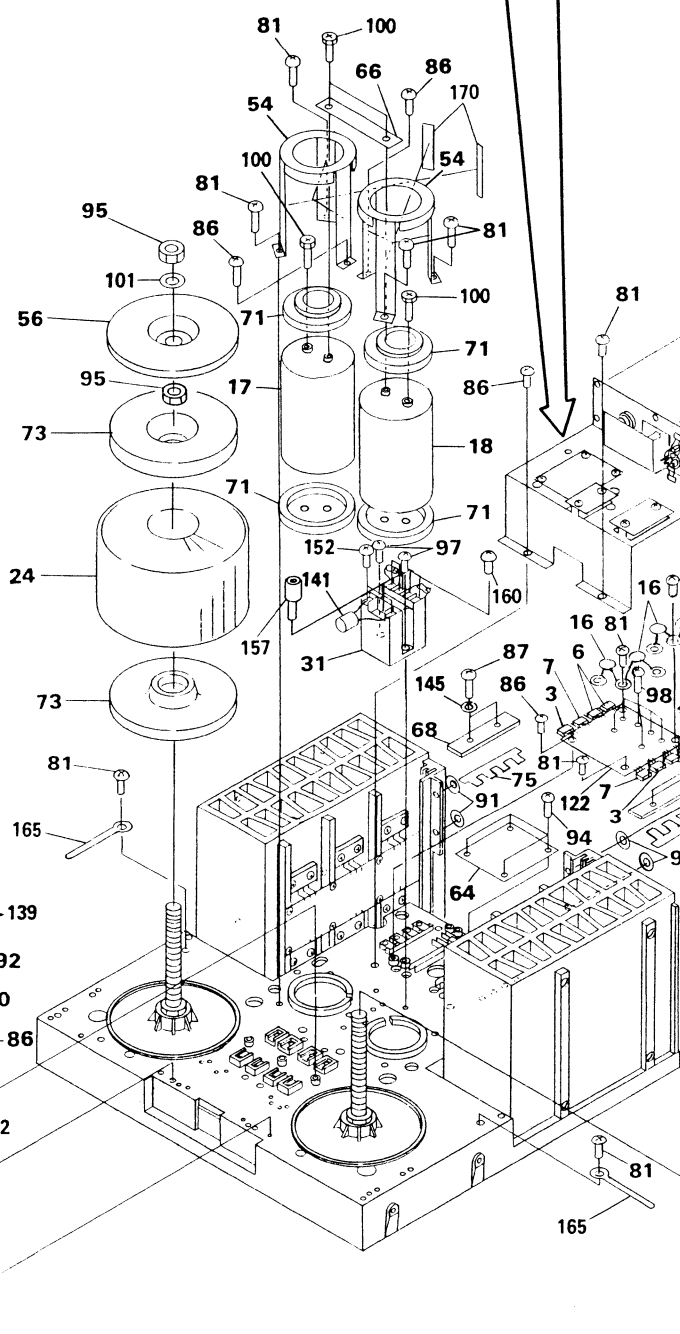


L SIDE HEAT SINK

(R SIDE HEAT SIN
SECTION and L SI
HEAT SINK SECTI
are symmetrical.)



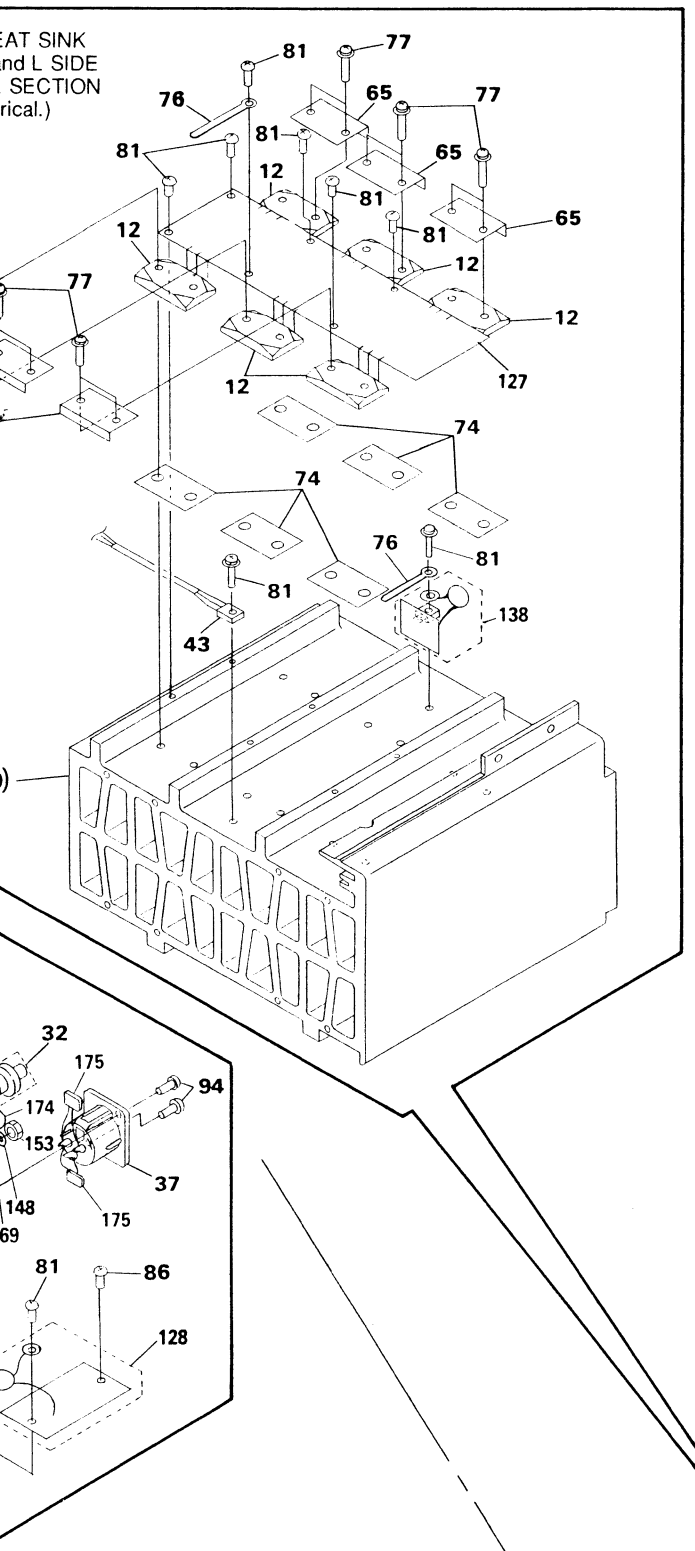
49 (50)



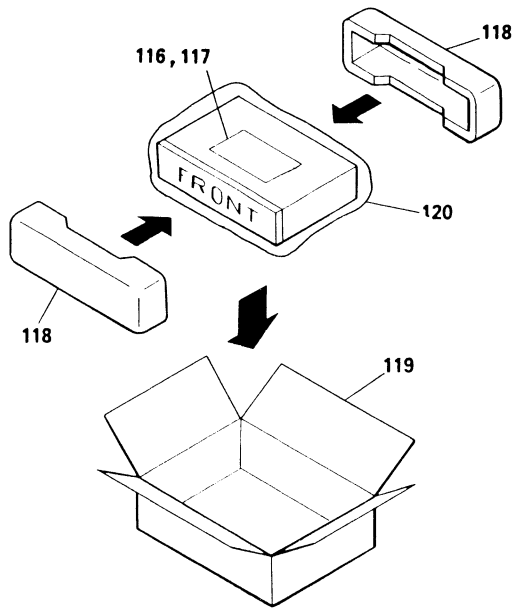
NOTE: Screws adjacent to ▼ mark on product are used for disassembly.

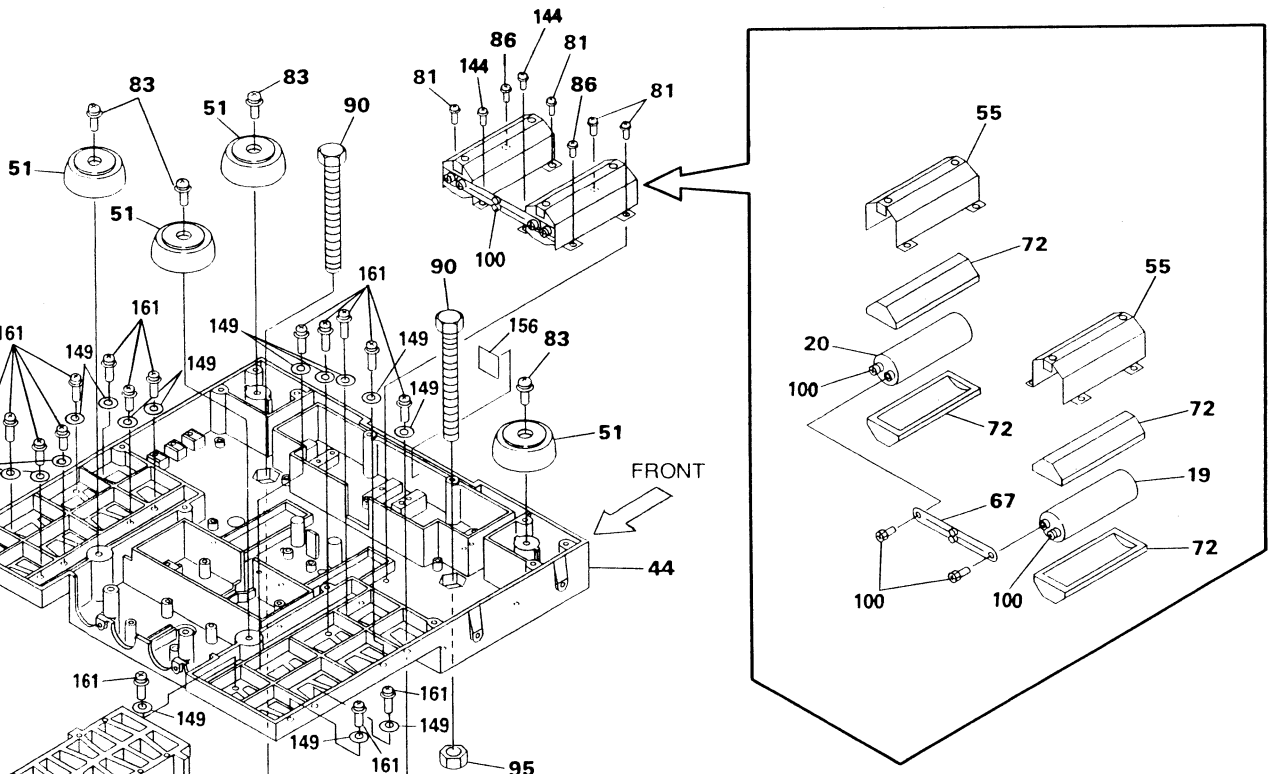
AT SINK SECTION

EAT SINK
nd L SIDE
SECTION
rical.)



• PACKING





(4) INTERIOR SECTION (3/3)
(Bottom View)

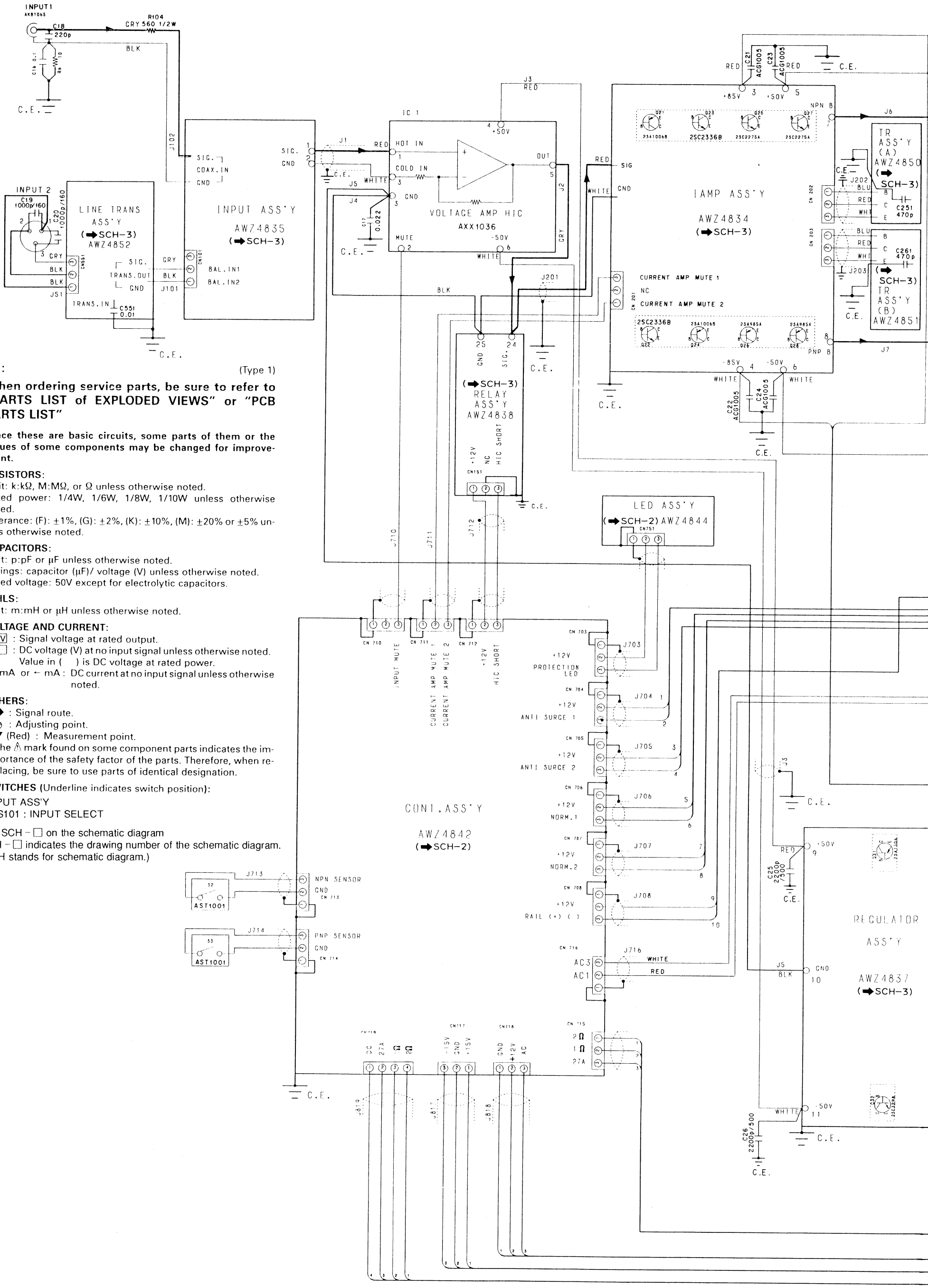
(2) INTERIOR SECTION (1/3)
(Top View)

R SIDE HEAT
SINK SECTION

(3) INTERIOR SECTION (2/3)
(Bottom View)

3. SCHEMATIC AND PCB CONNECTION DIAGRAMS

3.1 OVERALL WIRING DIAGRAM



Note: (Type 1)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST"**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or μF unless otherwise noted.
   Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or μH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   [V] : Signal voltage at rated output.
   [ ] : DC voltage (V) at no input signal unless otherwise noted. Value in ( ) is DC voltage at rated power.
   ⇦ mA or ← mA : DC current at no input signal unless otherwise noted.
7. **OTHERS:**
   - ➡ : Signal route.
   - ⊘ : Adjusting point.
   - ▼ (Red) : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SWITCHES** (Underline indicates switch position):
   INPUT ASS'Y
   S101 : INPUT SELECT
9. For SCH – □ on the schematic diagram
   SCH – □ indicates the drawing number of the schematic diagram.
   (SCH stands for schematic diagram.)

SCH-1 OVERALL

SCH-1

N-POWER ASS'Y
AWZ4839
(➡SCH-3)

P-POWER ASS'Y
AWZ4840
(➡SCH-3)

CHOKE ASS'Y
AWZ4833
(➡SCH-3)

SPEAKER TERMINAL

SENSOR ASS'Y (A)
AWZ4845
(➡SCH-2)

REG.ASS'Y (A)
AWZ4847
(➡SCH-2)

REG.ASS'Y (B)
AWZ4848
(➡SCH-2)

REG.ASS'Y (C)
AWZ4849
(➡SCH-2)

P-DIODE ASS'Y
AWZ4841
(➡SCH-3)

R-DIODE ASS'Y
AWZ4836
(➡SCH-3)

SENSOR ASS'Y (B)
AWZ4846
(➡SCH-2)

LAMP ASS'Y
AWZ4843
(➡SCH-2)

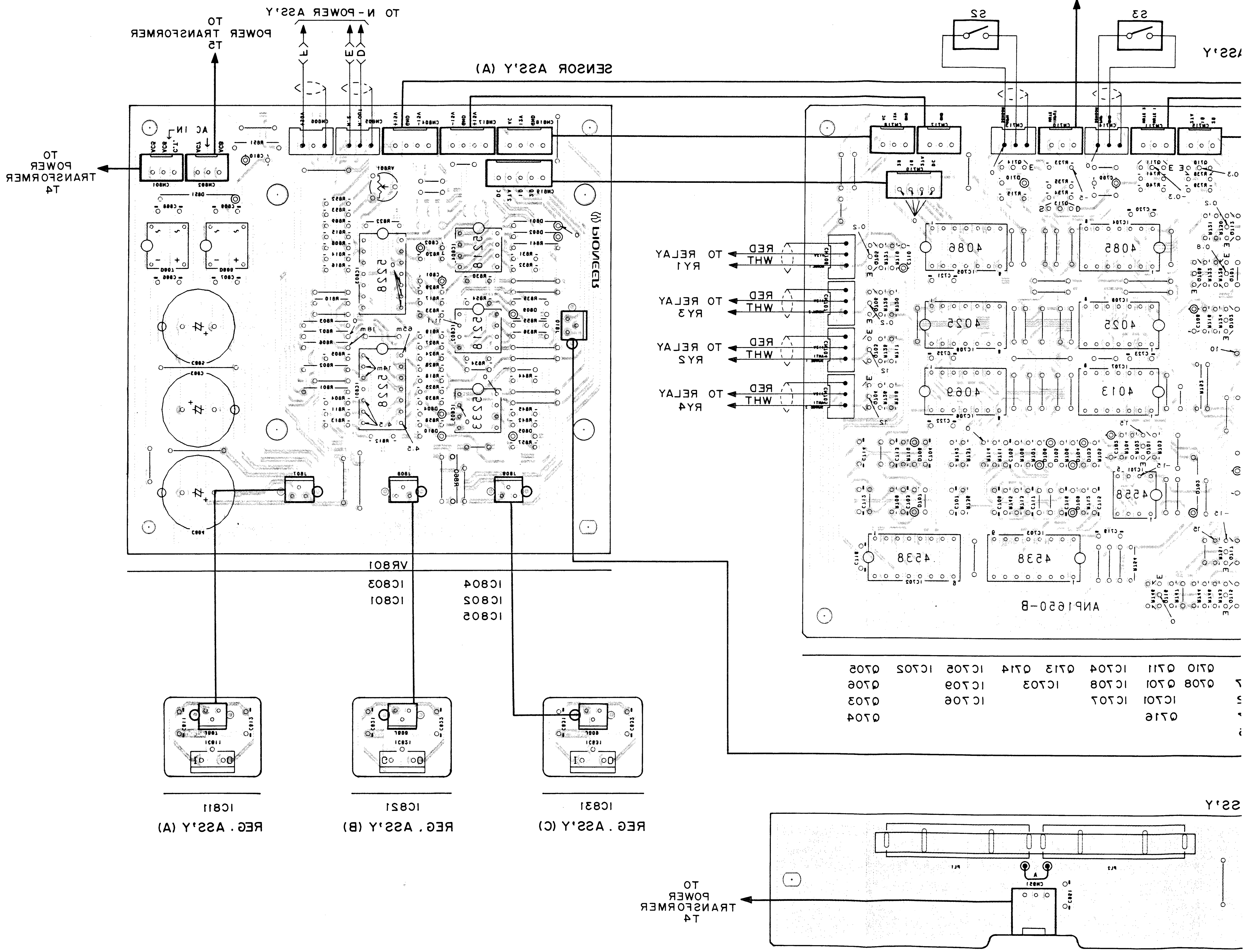
POWER TRANSFORMER
T2 :ATS1455
T3 :ATS1456
T4 :ATT1213
T5 :ATT1214

AC POWER CORD
ADG1139
AC230V 50/60Hz

OVERALL SCH-1

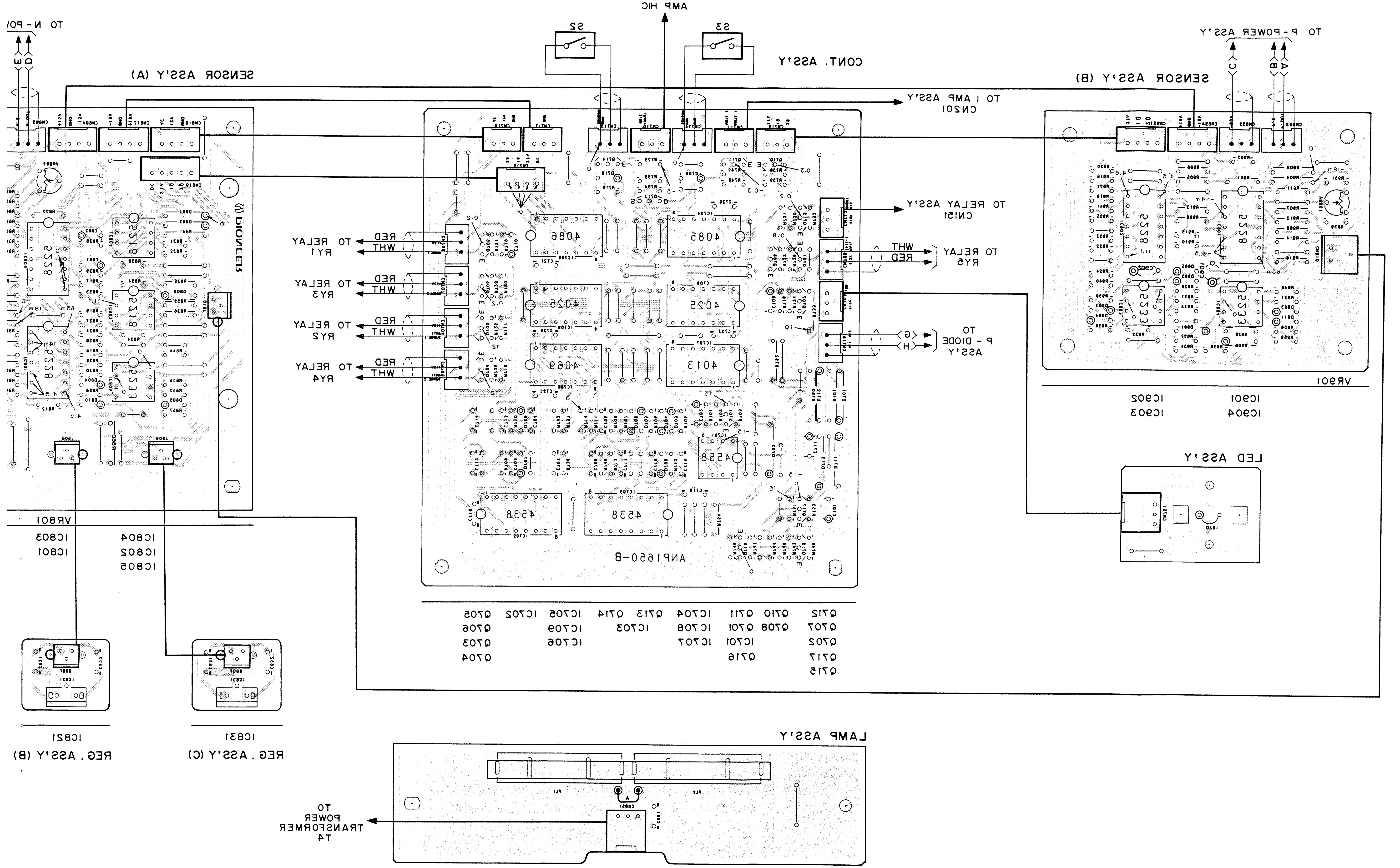
PCB-1

This P.C.B. connection diagram is viewed from the foil side.


TO POWER TRANSFORMER T5
TO N-POWER ASS'Y
SENSOR ASS'Y (A)
TO POWER TRANSFORMER T4
AC IN
PIONEER
TO RELAY RY1
TO RELAY RY3
TO RELAY RY2
TO RELAY RY4
RED
WHT
VR801
IC803
IC801
IC804
IC802
IC805
IC811
REG. ASS'Y (A)
IC821
REG. ASS'Y (B)
IC831
REG. ASS'Y (C)
TO VOLTAGE AMP HIC
S2
S3
ASS'Y
4086
4085
4025
4069
4013
4558
4538
ANP1650-B
Q710 Q711 IC704 Q713 Q714 IC705 IC702 Q705
Q708 Q701 IC708 IC703 IC709 Q706
IC701 IC707 IC706 Q703
Q716 Q704
SS'Y
TO POWER TRANSFORMER T4

3.2 CONT., LAMP, LED, SENSOR(A), SENSOR(B), REG.(A), REG.(B) AND REG.(C) ASSEMBLIES

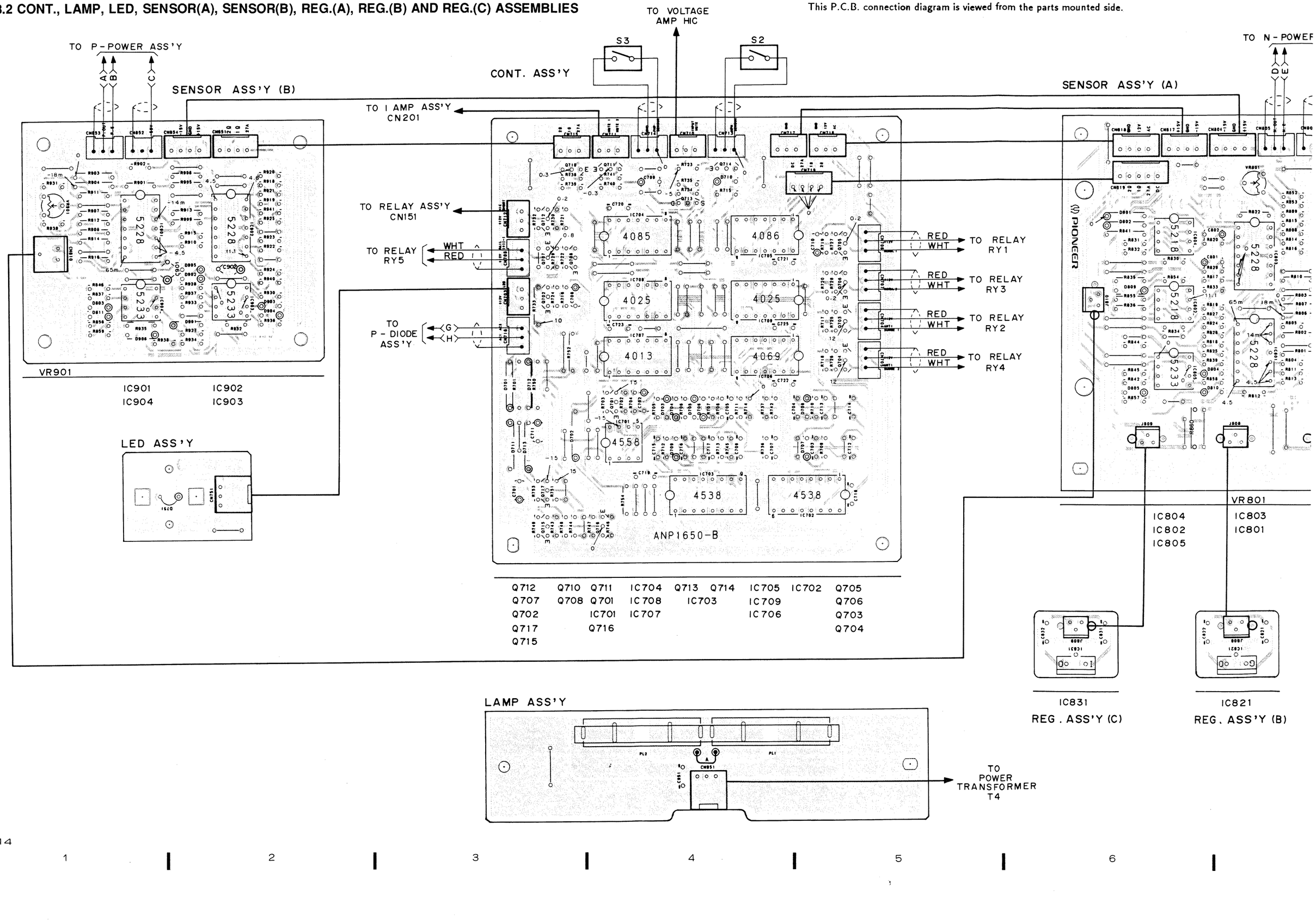
This P.C.B. connection diagram is viewed from the foil side.



TO N-POWER
SENSOR ASS'Y (A)
TO VOLTAGE AMP HIC
S2
S3
CONT. ASS'Y
TO I AMP ASS'Y CN201
TO P-POWER ASS'Y
SENSOR ASS'Y (B)
TO RELAY ASS'Y CN151
TO RELAY RY1
TO RELAY RY3
TO RELAY RY2
TO RELAY RY4
TO RELAY RY5
TO P-DIODE ASS'Y
RED
WHT
4086
4085
4025
4025
4069
4013
4558
4538
4538
ANP1650-B
5228
5218
5233
VR801
IC803 IC801
IC804 IC802 IC805
Q705 Q706 Q703 Q704
IC702
IC705 IC709 IC706
Q714
Q713 IC703
IC704 IC708 IC707
Q711 Q701 IC701 Q716
Q710 Q708
Q712 Q707 Q702 Q717 Q715
VR901
IC902 IC903
IC901 IC904
LED ASS'Y
IC821
REG. ASS'Y (B)
IC831
REG. ASS'Y (C)
LAMP ASS'Y
TO POWER TRANSFORMER T4

3.2 CONT., LAMP, LED, SENSOR(A), SENSOR(B), REG.(A), REG.(B) AND REG.(C) ASSEMBLIES

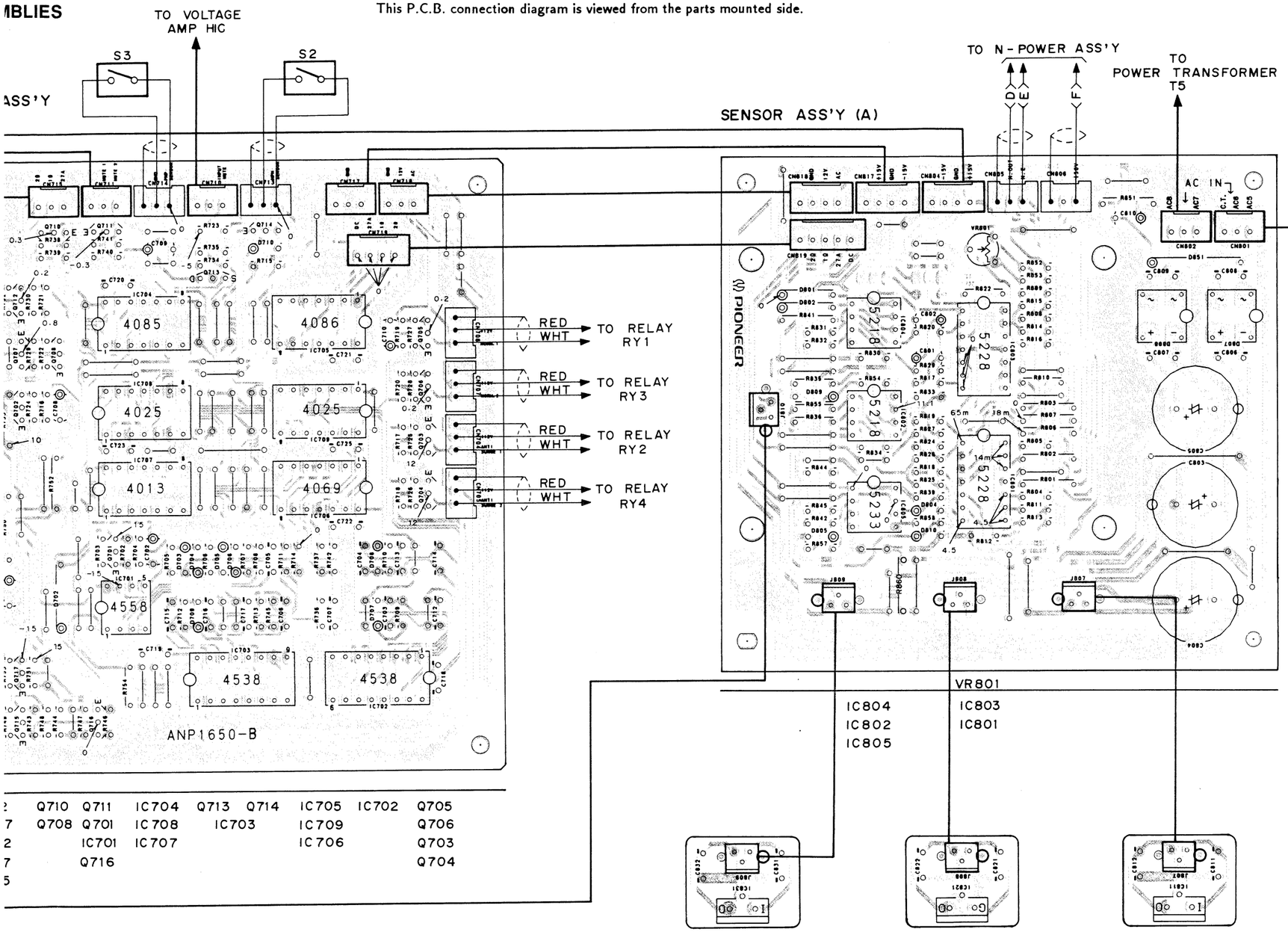
This P.C.B. connection diagram is viewed from the parts mounted side.

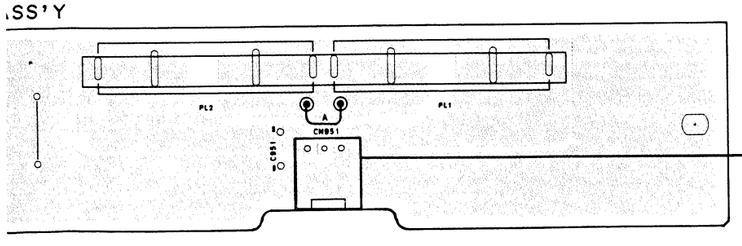


IBLIES

This P.C.B. connection diagram is viewed from the parts mounted side.

PCB-1





NOTE

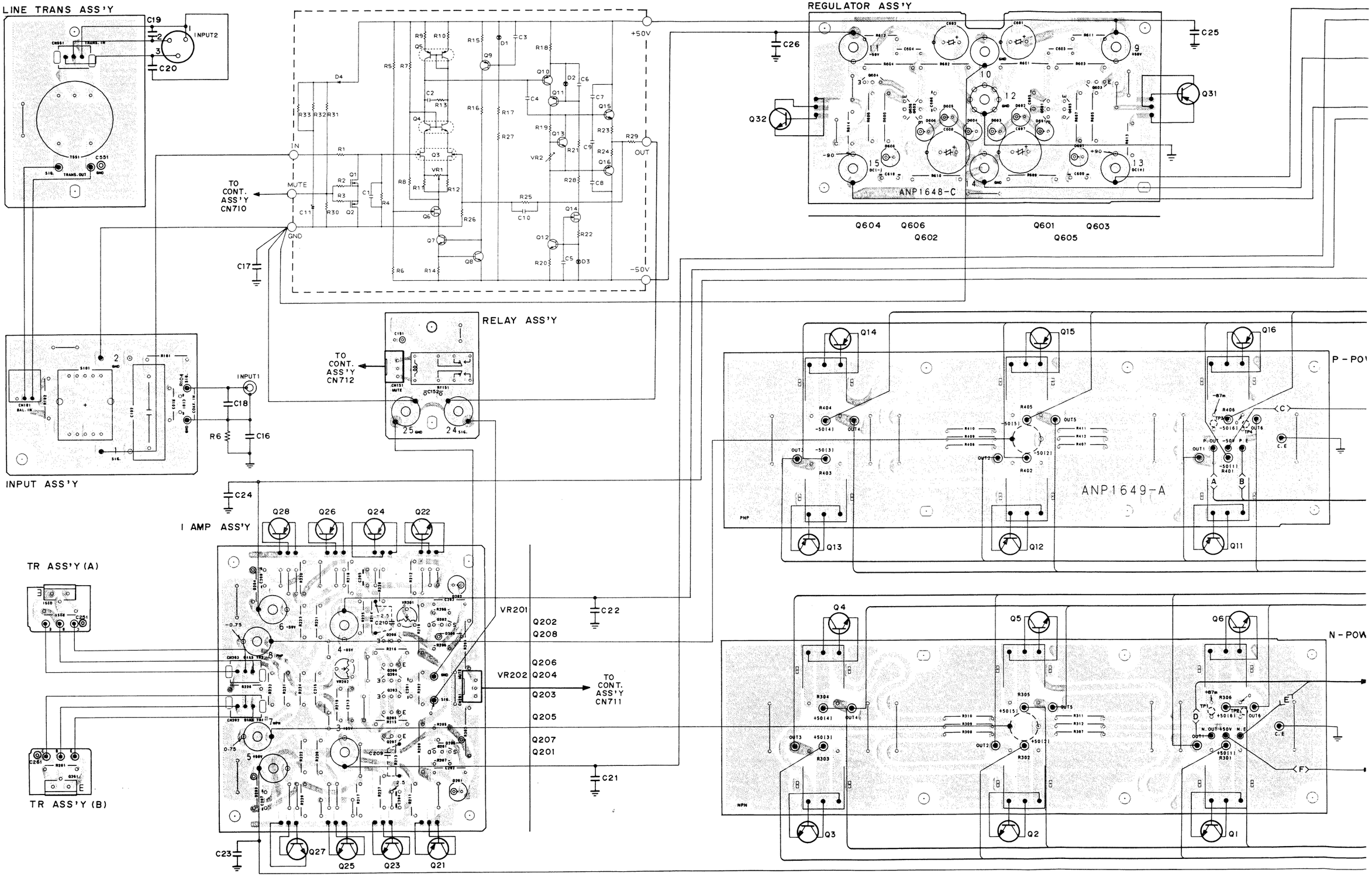
1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wirng symbols listed in the following Table.

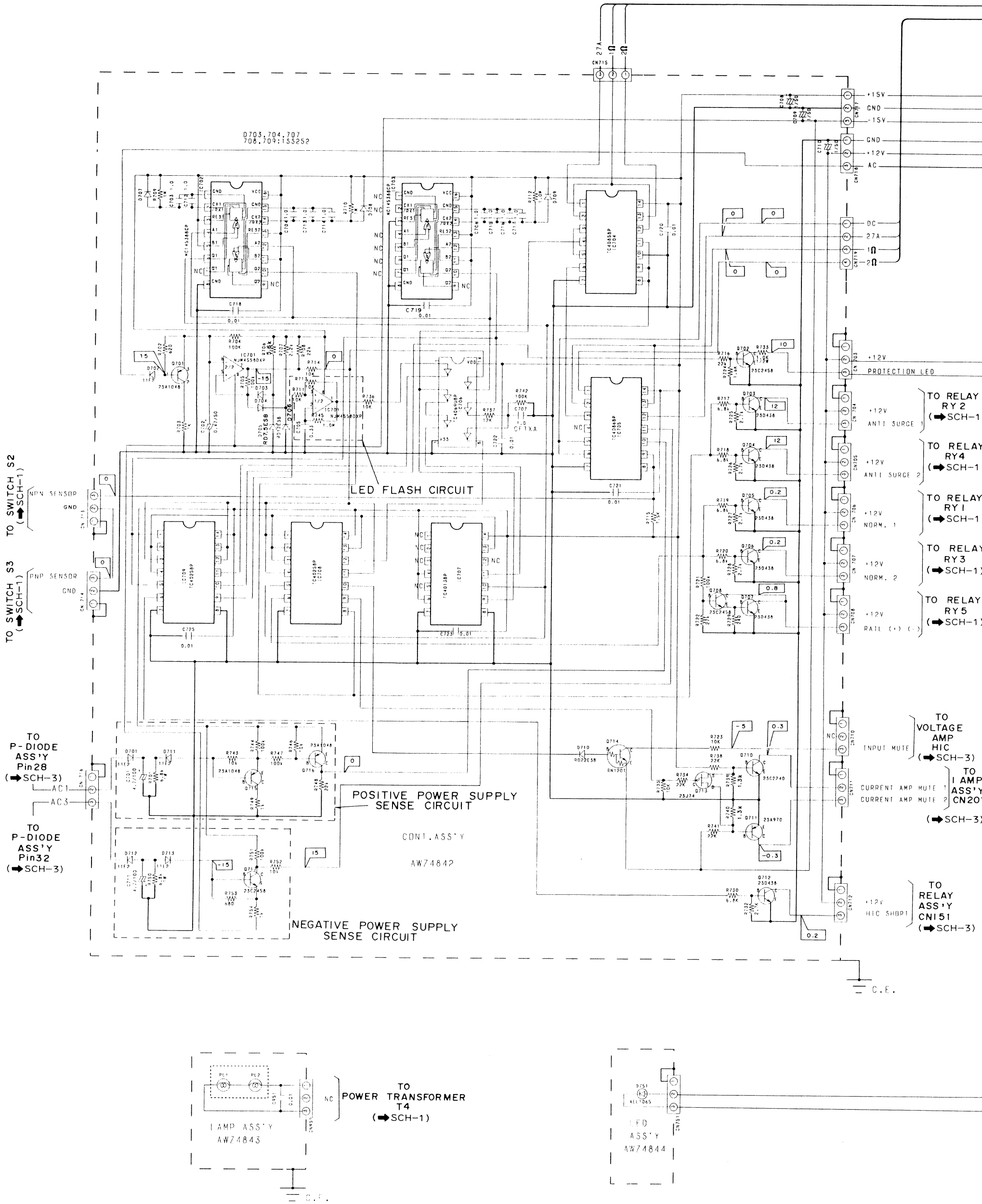
P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
Q504 (E)	(E) or (E)	Transistor
Q215	or	Radiator type transistor
D203	D203	Diode
R237	R237	Resistor
C513	+	Capacitor (Polarity)
C518		Capacitor (Non-polarity)

Others

P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

3. The capactor terminal marked with ◎ (double circles) shows negative terminal.
4. The diode terminal marked with ◎ (double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.


LINE TRANS ASS'Y
INPUT2
C19
C20
T551
C551
SIG.
TRANS.OUT
GND
TRANS. IN
CN551
TO CONT. ASS'Y CN710
IN
MUTE
GND
OUT
+50V
-50V
C17
R29
C25
C26
Q31
Q32
REGULATOR ASS'Y
ANP1648-C
Q604 Q606 Q602
Q601 Q603 Q605
RELAY ASS'Y
TO CONT. ASS'Y CN712
CN151
MUTE
INPUT1
C18
R6
C16
INPUT ASS'Y
C24
I AMP ASS'Y
Q28 Q26 Q24 Q22
Q27 Q25 Q23 Q21
C23
VR201
Q202 Q208
Q206 Q204
Q203 Q205
Q207 Q201
C22
C21
TO CONT. ASS'Y CN711
TR ASS'Y (A)
TR ASS'Y (B)
Q14 Q15 Q16
Q13 Q12 Q11
ANP1649-A
PNP
P-POW
Q4 Q5 Q6
Q3 Q2 Q1
NPN
N-POW



SCH-2 CONT.,LAMP,LED,SENSOR(A), SENSOR(B),REG.(A),REG.(B), REG.(C) ASSY

TO N-POWER ASS'Y J806 (➡SCH-3)

TO N-POWER ASS'Y J805 (➡SCH-3)

SENSOR ASS'Y (A)
AWZ4845

NPN OUTPUT TRANSISTOR ASO PROTECTION

DC OFFSET PROTECTION CIRCUIT

TO POWER TRANS-FORMER T4 (➡SCH-1)

TO POWER TRANS-FORMER T5 (➡SCH-1)

REG.ASS'Y(A) J487 — NJM78M15FA3 — AWZ4847

REG.ASS'Y(B) J488 — NJM79M15FA — AWZ4848

REG.ASS'Y (C) J489 — NJM7812FA3 — AWZ4849

TO P-POWER ASS'Y J852 (➡SCH-3)

TO P-POWER ASS'Y J853 (➡SCH-3)

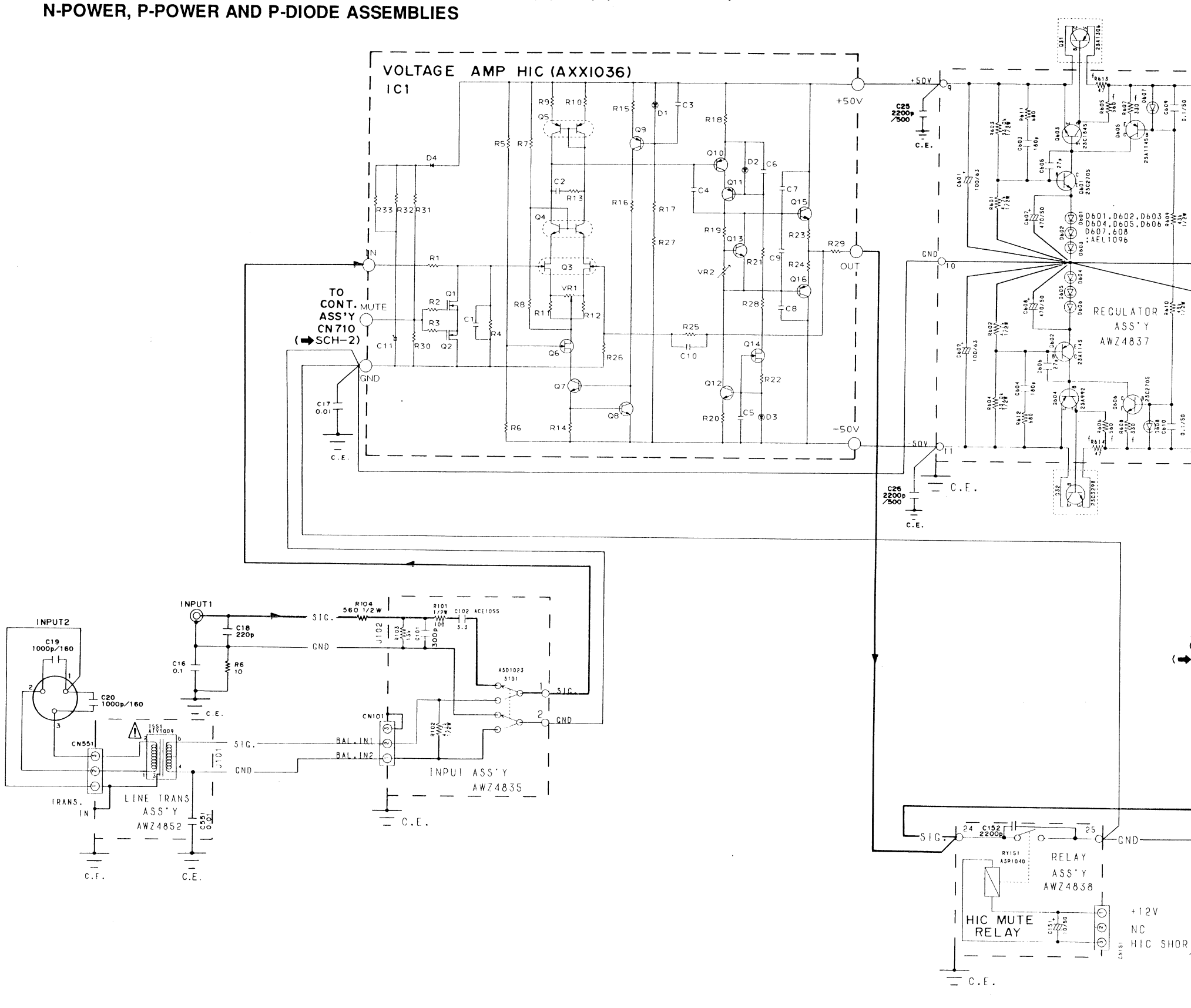
SENSOR ASS'Y (B)
AWZ4846

PNP OUTPUT TRANSISTOR ASO PROTECTION

CONT.,LAMP,LED,SENSOR(A), SENSOR(B),REG.(A),REG.(B), REG.(C) ASSY

SCH-2

3.3 CHOKE, I AMP, INPUT, R-DIODE, REGULATOR, RELAY, TR(A), TR(B), LINE TRANS, N-POWER, P-POWER AND P-DIODE ASSEMBLIES



SCH-3 CHOKE, I AMP, INPUT, R-DIODE, REGULATOR, RELAY, TR(A), TR(B), LINE TRANS, N-POWER, P-POWER AND P-DIODE ASSY

TO CAPACITOR C14 (➡SCH-1)

TO E. BAR (➡SCH-1)

TO CAPACITOR C15 (➡SCH-1)

J302-1 TO RELAY RY5 (➡SCH-1)

+50V 6 | +50V 5 | +50V 4 | +50V 3 | +50V 2 | +50V 1

TP1 TP2 IDLE CHECK

N-POWER ASS'Y AWZ4839

OUT 6 | OUT 5 | OUT 4 | NPN B | OUT 3 | OUT 2 | OUT 1

J301-1 TO RELAY RY5 (➡SCH-1)

J805 NPN E WHT / NPN OUT RED / +50V WHT — TO SENSOR ASS'Y (A) CN805 (➡SCH-2)

J806 — TO SENSOR ASS'Y (A) CN806 (➡SCH-2)

J303 C.E.

J302-2 J301-2

TO CAPACITOR C14 (➡SCH-1) +85V

TO RELAY RY5 (➡SCH-1) +50V

CURRENT SOURCE MUTE

CONSTANT CURRENT SOURCE

8mA 12mA 11mA 11mA

TO CONT. ASS'Y CN711 (➡SCH-2) MUTE NC

DRIVER STAGE

2.5 -2.5

J201 SIG. GND

TO CONT. ASS'Y CN712 (➡SCH-2) +12V NC HIC SHORT

VR202: IDLE CURRENT ADJUSTMENT

VR201: DC OFFSET ADJUSTMENT

I AMP ASS'Y AWZ4834

-85V -50V

TO CAPACITOR C15 (➡SCH-1) TO RELAY RY5 (➡SCH-1)

NPN B 7 / PNP B 8 — 0.75 / -0.75

CN202 CN203

TR ASS'Y (A) AWZ4850 — J202 BLU / RED / WHT — Q251

TR ASS'Y (B) AWZ4851 — J203 BLU / RED / WHT — Q261

Q251, Q261: BIAS THERMAL COMPENSATION TRANSISTOR

NPN IN 20 / PNP IN 21

LS01 1H105A 1.0w — RS01 ACN.136 10/5W — CP501 AXW1001 0.01 10

22 TO OUT SPEAKER TERMINAL (➡SCH-1) ⊕

23 TO GND SPEAKER TERMINAL (➡SCH-1) ⊖

CHOKE ASS'Y AWZ4833

J402-1 TO RELAY RY5 (➡SCH-1)

-50V 6 | -50V 5 | -50V 4 | -50V 3 | -50V 2 | -50V 1

TP3 TP4 IDLE CHECK

P-POWER ASS'Y AWZ4840

OUT 6 | OUT 5 | OUT 4 | PNP B | OUT 3 | OUT 2 | OUT 1

J401-1 TO RELAY RY5 (➡SCH-1)

J853 PNP E WHT / PNP OUT RED / -50V WHT — TO SENSOR ASS'Y (B) CN853 (➡SCH-2)

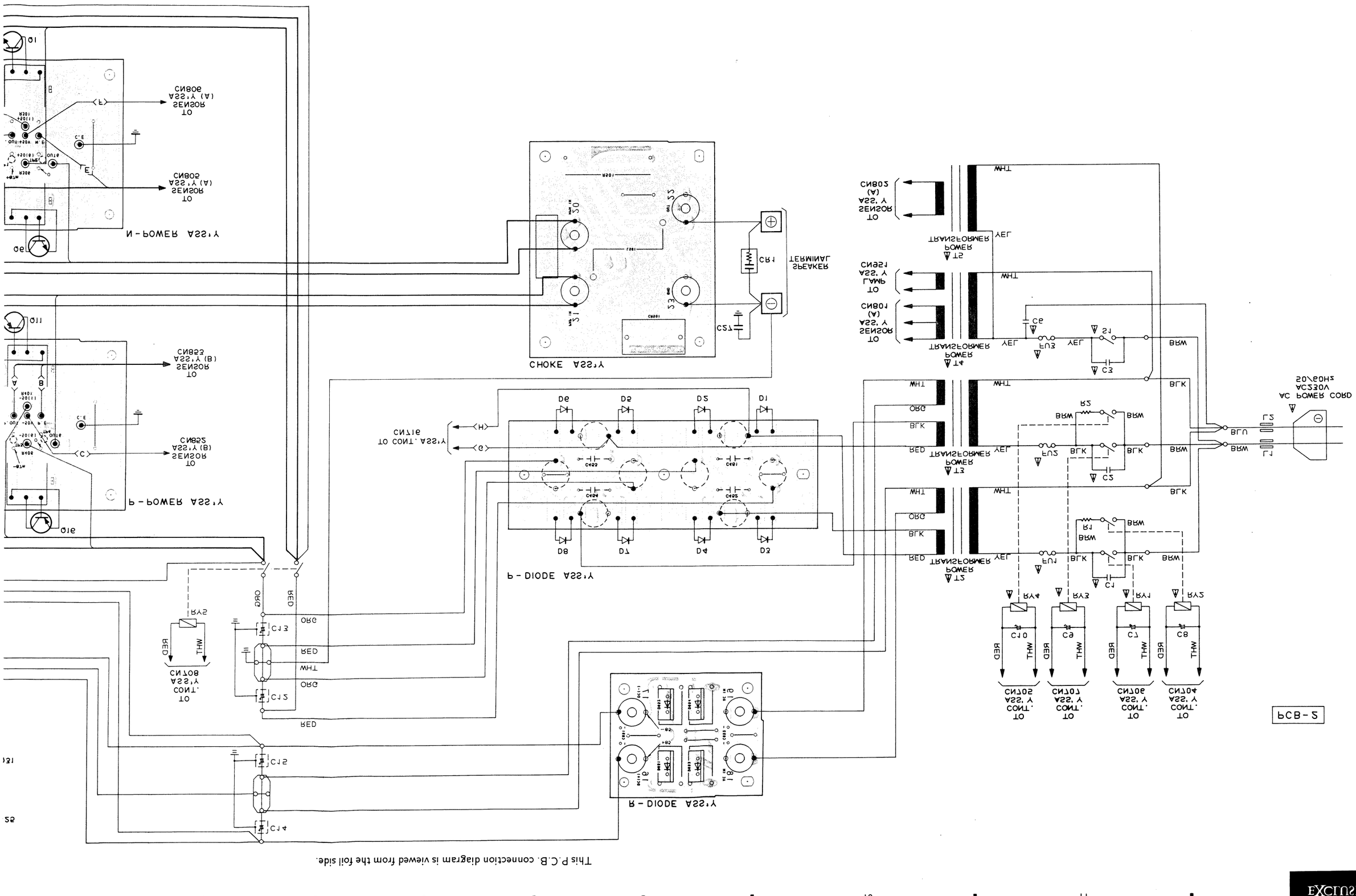
J852 — TO SENSOR ASS'Y (B) CN852 (➡SCH-2)

J403 C.E.

J402-2 J401-2

CHOKE, I AMP, INPUT, R-DIODE, REGULATOR, RELAY, TR(A), TR(B), LINE TRANS, N-POWER, P-POWER AND P-DIODE ASSY

SCH-3


N-POWER ASS'Y
CN806 ASS'Y (A) SENSOR TO
CN802 ASS'Y (A) SENSOR TO
P-POWER ASS'Y
CN823 ASS'Y (B) SENSOR TO
CN825 ASS'Y (B) SENSOR TO
CHOKE ASS'Y
TERMINAL SPEAKER
P-DIODE ASS'Y
CN719 TO CONT. ASS'Y
R-DIODE ASS'Y
CN808 ASS'Y CONT. TO
CN702 ASS'Y CONT. TO
CN703 ASS'Y CONT. TO
CN704 ASS'Y CONT. TO
CN705 ASS'Y CONT. TO
CN707 ASS'Y CONT. TO
CN709 ASS'Y CONT. TO
TRANSFORMER POWER
AC POWER CORD
AC230V 50/60Hz
PCB-S
This P.C.B. connection diagram is viewed from the foil side.
EXCLUSIVE

This P.C.B. connection diagram is viewed from the parts mounted side.

PCB-2

C25

Q31

C14

C15

R-DIODE ASS'Y

TO CONT. ASS'Y CN708

RED

WHT

RY5

C12

C13

ORG

RED

ORG

RED

ORG

TO CONT. ASS'Y CN705

TO CONT. ASS'Y CN707

TO CONT. ASS'Y CN706

TO CONT. ASS'Y CN704

C10

C9

C7

C8

RY4

RY3

RY1

RY2

P-DIODE ASS'Y

D8 D7 D4 D3

D6 D5 D2 D1

C454 C452 C453 C451

TO CONT. ASS'Y CN716

G

H

T2 POWER TRANSFORMER

T3 POWER TRANSFORMER

T4 POWER TRANSFORMER

T5 POWER TRANSFORMER

RED BLK ORG WHT

YEL

FU1 FU2 FU3

C1 C2 C3

BLK BRW BLU

R1 R2

S1 C6

L1 L2

AC POWER CORD AC230V 50/60Hz

TO SENSOR ASS'Y (A) CN801

TO LAMP ASS'Y CN951

TO SENSOR ASS'Y (A) CN802

P-POWER ASS'Y

Q16

Q11

TO SENSOR ASS'Y (B) CN852

TO SENSOR ASS'Y (B) CN853

N-POWER ASS'Y

Q6

Q1

TO SENSOR ASS'Y (A) CN805

TO SENSOR ASS'Y (A) CN806

CHOKE ASS'Y

C27

CR1

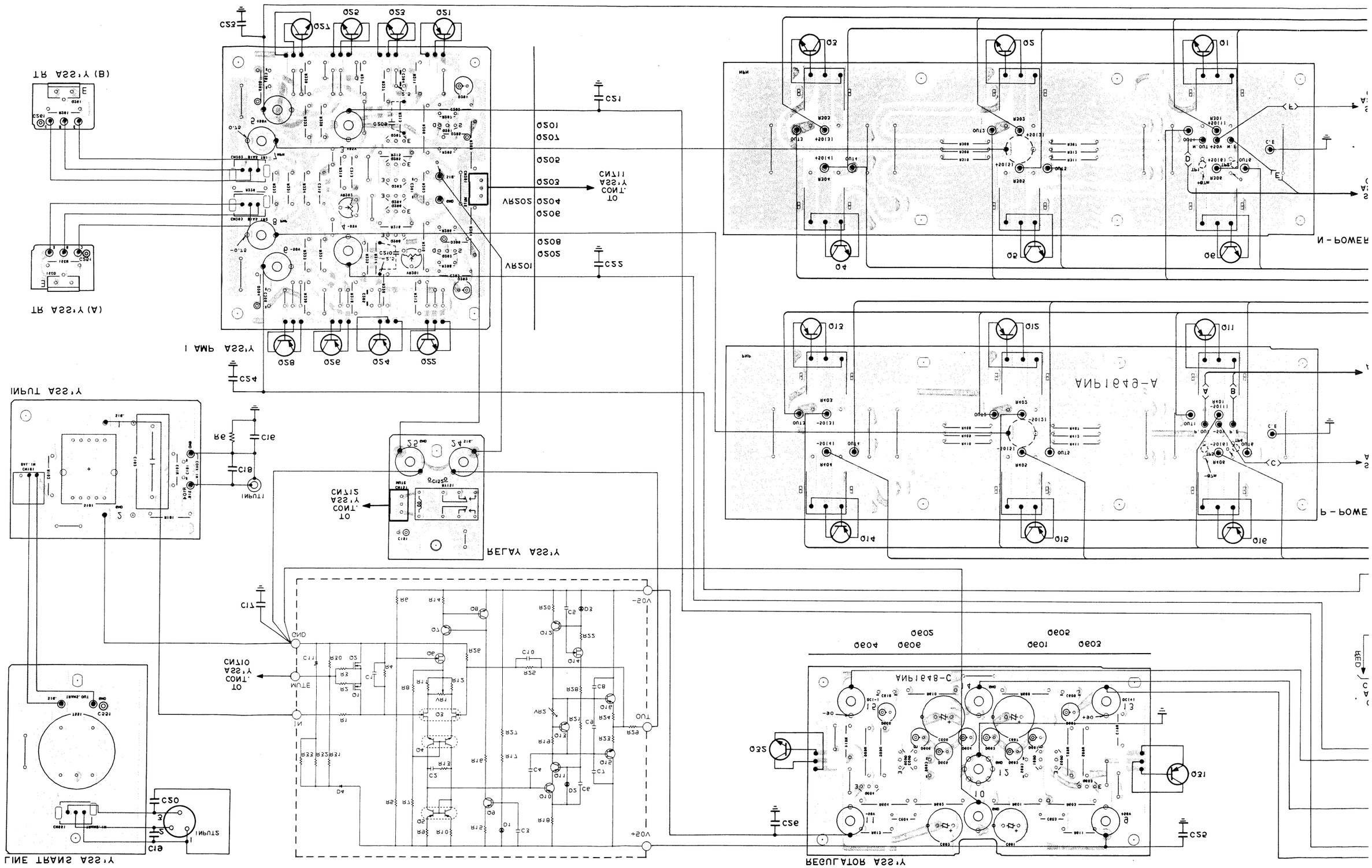
SPEAKER TERMINAL

A

B

C

D


A-BAND INPUT & OUTPUT
B-BAND INPUT & OUTPUT
C-BAND INPUT & OUTPUT
A - POWER
B - POWER
C - POWER
REGULATOR ASS'Y
RELAY ASS'Y
LINE TRANS ASS'Y
INPUT ASS'Y
TR ASS'Y (A)
TR ASS'Y (B)
MAIN ASS'Y
TO CONT. ASS'Y CN11
TO CONT. ASS'Y CN12
TO CONT. ASS'Y CN13
TO CONT. ASS'Y CN10
GND
-VO2
+VO2
-VO1
+VO1
INPUT
OUTPUT

4. PCB PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω →56×10¹ → 561 ..... RD1/8PM 5 6 1 J

47kΩ →47×10³ → 473 ..... RD1/4PS 4 7 3 J

0.5Ω → 0R5 ..... RN2H 0 R 5 K

1Ω →010 ..... RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ→ 562×10¹ → 5621 ..... RN1/4PC 5 6 2 1 F

Mark	No.	Description	Parts No.
LIST OF ASSEMBLIES			
NSP		AF ASS'Y(A)	AWK1671
NSP		├ CHOKE ASS'Y	AWZ4833
		├ I AMP ASS'Y	AWZ4834
		├ INPUT ASS'Y	AWZ4835
NSP		├ R−DIODE ASS'Y	AWZ4836
		├ REGULATOR ASS'Y	AWZ4837
NSP		├ RELAY ASS'Y	AWZ4838
		├ TR ASS'Y(A)	AWZ4850
		├ TR ASS'Y(B)	AWZ4851
		└ LINE TRANS ASS'Y	AWZ4852
NSP		AF ASS'Y(B)	AWK1672
		├ N−POWER ASS'Y	AWZ4839
		├ P−POWER ASS'Y	AWZ4840
NSP		└ P−DIODE ASS'Y	AWZ4841
NSP		CONTROL ASS'Y	AWP1046
		├ CONT. ASS'Y	AWZ4842
NSP		├ LAMP ASS'Y	AWZ4843
NSP		├ LED ASS'Y	AWZ4844
		├ SENSOR ASS'Y(A)	AWZ4845
		├ SENSOR ASS'Y(B)	AWZ4846
		├ REG. ASS'Y(A)	AWZ4847
		├ REG. ASS'Y(B)	AWZ4848
		└ REG. ASS'Y(C)	AWZ4849
CHOKE ASS'Y			
COILS, FILTERS			
	L501		ATH1058
RESISTORS			
	R501	(10,5W)	ACN−136
OTHERS			
	CR501		AXW1001
		STAR TERMINAL B	AKE1028
I AMP ASS'Y			
SEMICONDUCTORS			
	Q203,Q205,Q207		2SA992
	Q204,Q206,Q208		2SC1845
	Q202		2SJ74
	Q201		2SK170
	D203,D204		11E2
	D205,D206		1SS252
	D201,D202		AEL1096
CAPACITORS			
	C213	(0.1u)	ACE1054
	C209,C210		CKDYB103K50
	C201		CMA101J500
	C204,C205		CMA470J500
	C202,C203		CQSXA103J160
	C215		CQSXA103J160
	C207,C208		CQSXA681J160
RESISTORS			
	VR201		VRTS6VS101
	VR202		VRTS6VS222
	R224		RD1/2PMFL151J
	R220−R223		RD1/2PMFL2R2J
	R219		RD1/4PMFL272J
	R215,R216		RD1/4PMFL472J
	R226		RD1/4PMFL561J
	R209,R210		RDR1/2PM433J
	R203,R204		RDR1/2PM473J
	R229,R230		RDR1/4PM100J
	R225		RDR1/4PM102J
	R231,R232		RDR1/4PM471J
	R202		RDR1/4PM513J
	R212		RFA1/4PS101J
	R211		RFA1/4PS151J
	R227,R228		RFA1/4PS221J
	R217,R218		RFA1/4PS470J
	R213,R214		RFA1/4PS820J
		Other Resistors	RD1/8PM□□□J
OTHERS			
		STAR TERMINAL B	AKE1028
INPUT ASS'Y			
SWITCHES			
	S101		ASD1023
CAPACITORS			
	C102	(3.3u)	ACE1055
	C101		CMA301J500

Mark No.	Description	Parts No.
RESISTORS		
R101		RDR1/2PM101J
R102		RDR1/2PM472J
R104		RDR1/2PM561J
R103		RDR1/4PM133J
OTHERS		
	STAR TERMINAL B	AKE1028

R-DIODE ASS'Y

SEMICONDUCTORS		
D651 – D654		F10KF40
CAPACITORS		
C651,C652 (0.01/AC250V)		ACG1005
OTHERS		
	STAR TERMINAL B	AKE1028

REGULATOR ASS'Y

SEMICONDUCTORS		
Q602,Q605		2SA1145
Q604		2SA992
Q603		2SC1845
Q601,Q606		2SC2705
D601 – D608		AEL1096
CAPACITORS		
C601,C602		CEEA101M63
C607,C608		CEEA471M50
C609,C610		CFTXA104J50
C603,C604		CMA181J500
C605,C606		CMA270J500
RESISTORS		
R603,R604		RDR1/2PM333J
R609,R610		RDR1/2PM433J
R601,R602		RDR1/2PM472J
R611,R612		RDR1/4PM681J
R607,R608		RFA1/4PS331J
R613,R614		RFA1/4PS470J
R605,R606		RFA1/4PS561J
OTHERS		
	STAR TERMINAL A	AKE1027
	STAR TERMINAL B	AKE1028

RELAY ASS'Y

RELAYS		
RY151		ASR1040
CAPACITORS		
C151		CEAS100M50
C152		CQSXA222J160
OTHERS		
	STAR TERMINAL B	AKE1028

TR ASS'Y(A)

SEMICONDUCTORS		
Q251		2SC4137
CAPACITORS		
C251		CKDYB471K50

Mark No.	Description	Parts No.
RESISTORS		
R251		RDR1/4PM471J

TR ASS'Y(B)

SEMICONDUCTORS		
Q261		2SC4137
CAPACITORS		
C261		CKDYB471K50
RESISTORS		
R261		RDR1/4PM471J

LINE TRANS ASS'Y

COILS, FILTERS		
T551		ATV1009
CAPACITORS		
C551		CKDYB103K50

N-POWER ASS'Y

RESISTORS		
R301 – R306	(0.33, 5W)	ACN1102
R307 – R312		RFA1/4PS4R7J
OTHERS		
	STAR TERMINAL B	AKE1028

P-POWER ASS'Y

RESISTORS		
R401 – R406	(0.33, 5W)	ACN1102
R407 – R412		RFA1/4PS4R7J
OTHERS		
	STAR TERMINAL B	AKE1028

P-DIODE ASS'Y

CAPACITORS		
C451 – C454	(0.01/AC400V)	ACG1002
OTHERS		
	STAR TERMINAL B	AKE1028

CONT. ASS'Y

SEMICONDUCTORS		
IC702,IC703		MC14538BCP
IC701		NJM4558DXP
IC707		TC4013BP
IC708,IC709		TC4025BP
IC706		TC4069UBP
IC704		TC4085BP
IC705		TC4086BP
Q701,Q715,Q716		2SA1048
Q711		2SA970
Q710		2SC2240
Q702,Q708,Q717		2SC2458
Q703 – Q707,Q712		2SD438
Q713		2SJ74
Q714		RN1201
D701,D702,D711 – D713		11E2

Mark	No.	Description	Parts No.
	D703,D704,D707－D709		1SS252
	D706		RD12ESB
	D710		RD22ESB
	D705		RD7.5ESB
CAPACITORS			
	C708－C710		CEAS010M50
	C701,C711		CEAS4R7M100
	C702		CEASR47M50
	C703,C704,C706,C707, C712－C717		CFTXA105J50
	C705		CFTXA334J50
	C718－C723,C725		CKDYF103Z50
RESISTORS			
	R733		RD1/2PM102J
	R701,R750		RS1LMF682J
		Other Resistors	RD1/8PM□□□J
LAMP ASS'Y			
CAPACITORS			
	C951		CKDYF103Z50
LED ASS'Y			
SEMICONDUCTORS			
	D751		AEL1065
SENSOR ASS'Y(A)			
SEMICONDUCTORS			
	IC802,IC804		M5218AP
	IC801,IC803		M5228P
	IC805		M5233P
	D851		11E2
	D801,D802,D809,D810		1SS252
	D805		RD11ESB3
	D804		RD12ESB3
	D807,D808		S1WB20
CAPACITORS			
	C801,C802		CEAS101M10
	C804,C805		CEAS222M25
	C803		CEAS332M25
	C810		CEAS4R7M50
	C806－C809		CKDYF103Z50
RESISTORS			
	VR801		VRTB6VS101
	R860		RD1/2PM152J
	R851		RD1/2PM682J
	R804,R805		RDR1/6PU103J
	R801－R803		RDR1/6PU104J
	R810		RDR1/6PU203J
	R806,R807		RN1/2PC7501F
	R808,R809,R814,R815		RN1/4PC1001F
	R816,R819		RN1/4PC2702F
		Other Resistors	RD1/8PM□□□J

Mark	No.	Description	Parts No.
SENSOR ASS'Y(B)			
SEMICONDUCTORS			
	IC901,IC902		M5228P
	IC903,IC904		M5233P
	D811,D904－D906		1SS252
	D903		RD11ESB3
	D902		RD12ESB3
	D803,D901		RD5.6ESB3
CAPACITORS			
	C901,C902		CEJA100M16
RESISTORS			
	VR901		VRTB6VS101
	R905,R906		RDR1/6PU103J
	R901,R902		RDR1/6PU104J
	R903,R904		RN1/2PC7501F
	R907,R908,R911,R912		RN1/4PC1001F
	R914,R916		RN1/4PC2702F
		Other Resistors	RD1/8PM□□□J
OTHERS			
	CN810	CONNECTOR(3P)	KPE3
REG. ASS'Y(A)			
SEMICONDUCTORS			
	IC811		NJM78M15FAS
CAPACITORS			
	C811,C812		CQMA104K50
REG. ASS'Y(B)			
SEMICONDUCTORS			
	IC821		NJM79M15FA
CAPACITORS			
	C821,C822		CQMA104K50
REG. ASS'Y(C)			
SEMICONDUCTORS			
	IC831		NJM7812FAS
CAPACITORS			
	C831,C832		CQMA104K50

5. ADJUSTMENTS

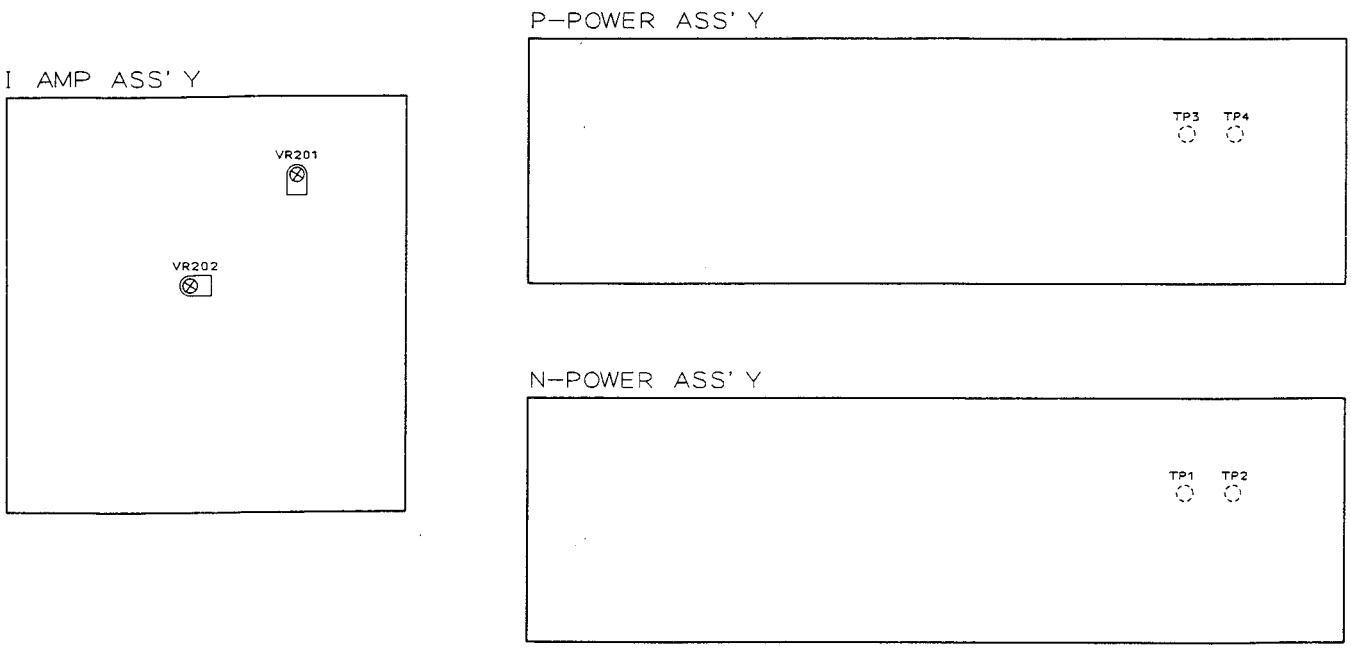
Center point adjustment

Adjust I AMP assy VR201 so that the DC voltage output (N-POWER assy TP2 or P-POWER assy TP4) is 0 V ± 10 mV.

Idle current adjustment

Adjust I AMP assy VR202 so that the DC voltage between TP1 and TP2 of the N-POWER assy (and between POWER assy TP3 and TP4) is 87 mV ± 7 mV.

Basic Adjustment Points and Test Points



Basic Adjustment Points and Test Points

6. CIRCUIT DESCRIPTION

6.1 Protection Section

This protection circuit detects abnormalities in power up (and down) operations, DC, overload, power transistor temperature, and power supply.

Power On : When the power is switched on, the AC detection circuit (CONT assy and IC701 peripheral circuits) works for 5 seconds and makes D751 (LED assy) blink. (During this period, there is no output from the speakers.)
After this, D751 normally blinks.

Power supply : (surge killer) For the first four seconds, Q703 and Q704 are on and the surge killer relays (RY2 and RY4) is triggered. After 3 seconds, Q705 and Q706 come on, the power relays (RY1 and RY3) are triggered, and at the same time Q707 and Q708 come on and the power DC relay (RY5) is triggered. [Refer to the circuit diagram of the CONT assy.]

Muting : After the initial 4 seconds, the CONT assy section Q710 and Q711 come on, switching off I AMP section Q201 and Q202 to end the muting and the bias current and idle current start to flow. 1 second later, Q712 (CONT assy) comes on and RY151 (normal short type) for muting (shorting) the IC1 (voltage amp HIC) output is cut (open). 10 millisecond later, Q714 (CONT assy) comes on and the IC1 muting is ended.

Abnormality : When there is an abnormality, D751 blinks. Specifically , the above power supply system and relays (RY1, RY3, and RY5) are switched off and I AMP and IC1 are muted.

Reset : This state continues until the power is switched off.
To reset from this state, switch off the power, eliminate the abnormality, then switch the power on again.
When the power is switched on, if the abnormality is still present, the unit goes into the above alarm state right after the power is switched on.

Power transistor temperature detection section:

S2 and S3 (connected to CONT assy CN713 and CN714) are normal short type thermal switches that are triggered (opened) if the temperature of the section where they are installed reaches 105℃. Thus, abnormally high temperature in either of the heat sinks triggers the protection circuit.

DC detection section:

The DC detection circuit (IC803-2/4, 1/4, IC804 peripheral circuits) detects output section DC voltages (+3V min.; -3V max.) and triggers the protection circuit. [Refer to the circuit diagram of SENSOR assy (A).]

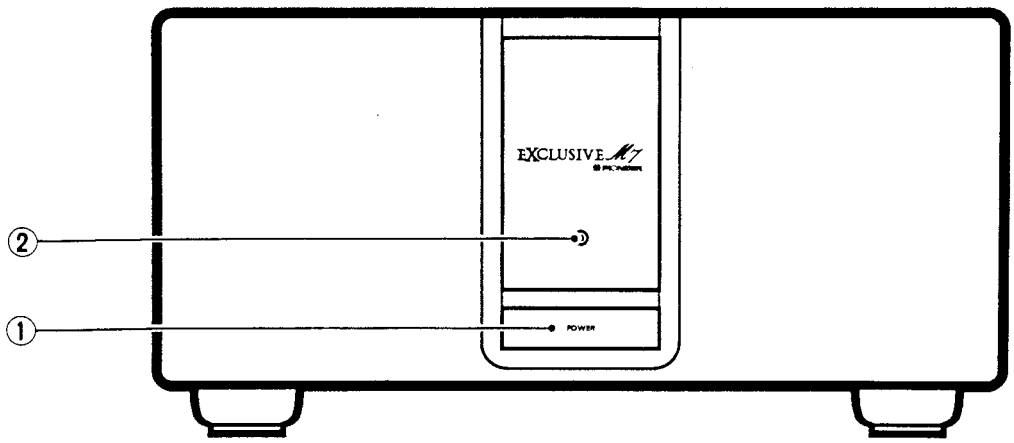
Overload detection section:

This section detects (+ side: IC803-4/4, 801-1/4, 904-1/2; - side IC901-1/4, 2/4, 904-2/2 peripheral circuits) the collector current for the output stage power transistors (+ side: Q1-Q6; - side Q11-Q16) by detecting the voltage across emitter resistors. With this collector current data, the Vce detection data (+ side IC801-3/4, 4/4, 2/4; - side IC901/4/4, 3/4, IC902-1/4 peripheral circuits) and their sum, this section calculates the pseudo-load 2 Ω overload conditions (+ side IC802-1/4, IC805-2/2; - side IC902-4/4, IC903-1/2 peripheral circuits) and the 1 Ω overload conditions (+ side IC802-2/2, IC805-1/2; - side IC902-3/4, IC903-2/2 peripheral circuits) to trigger the protection circuit as necessary. [Refer to the circuit diagrams of SENSOR assy (A) and (B).]

Power supply abnormality detection:

This section detects any abnormality in the transformer T2 or T3 power supply and triggers the protection circuit as necessary. The protection circuit is triggered by the CONT assy CN716 (J716) AC1 (+ side) and AC3 (- side) (low) voltage data.

7. PANEL FACILITIES



① Power Switch

Push this switch and the power enters the EXCLUSIVE M7, illuminating the power indicator. Push the power switch again and the power is cut.
When the switch is pushed ON, no sound comes out of the speakers for approximately 5 seconds, This allows the muting circuit to operate, preventing noise when the power is switched on.

② Power Indicator

Flashes for approx. 5sec when the power is switched on. While the indicator is flashing, the protecting circuit is operating, therefore, no sound is transmitted from the speakers. When the power indicator constantly flashes without fully illuminating, switch OFF the power and read the section regarding the protecting circuit on page 6.

8. SPECIFICATIONS

Amplifier section

Rated output ..... 20 Hz ~ 20 kHz, 120 W (8 Ω)
20 Hz ~ 20 kHz, 240 W (4 Ω)
1 kHz, 480 W (2 Ω)
Input terminals (sensitivity/impedance)
INPUT 1 ..... 1.0 V/10 kΩ
INPUT 2 ..... 1.0 V/4.7 kΩ
Output terminals (SPEAKER) ..... 2 ~ 8 Ω
Dunping factor (20 Hz ~ 20 kHz, 8 Ω) 100

Miscellaneous

Power requirements ..... AC 230 V, 50/60 Hz
Power consumption ..... 800 W
External dimensions ..... 460(W) × 220(H) × 441(D)mm
Weight ..... 47 kg

Accessories

Ground Cable 1
Operating Instructions 1

NOTE:
The specifications and appearance noted above are subject to change without notice due to improvements.